

ORGANIC AEROSOLS IN THE ATMOSPHERE OF TITAN

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ABSTRACT

Titan, the largest satellite of Saturn has an atmosphere mainly composed of N_2 and CH_4 . Its atmosphere goes through chemical transformation due to irradiation by UV photons from the Sun and by charged particles trapped into the magnetosphere of Saturn. In an experiment simulating the deposition of auroral electrons, a continuous-flow low pressure plasma-discharge through 9:1 N_2/CH_4 atmospheres, produced more complex organics. Nine hydrocarbons, six nitriles and three other incompletely identified N-bearing compounds were detected in the gas-phase and precipitating dust and aerosols onto the walls of the discharge tube. At the higher pressure corresponding to cosmic ray irradiation of the Titan troposphere, 62 gas-phase species were identified, including 27 nitriles, and large amount of tholins. The abundance of C_2H_6 and C_3H_8 being the photolytic products of CH_4 are not expected to agree well with the results of charged particle irradiation